



COURSE DESCRIPTION

1. Information about the programme

1.1 Institution of higher education	Alexandru Ioan Cuza University of Iasi
1.2 Faculty	Faculty of Economics and Business Administration
1.3 Department	Department of Accounting, Information Systems and Statistics
1.4 Field of study	Business Informatics
1.5 Level	Master
1.6 Study programme/ Qualification	Software Development and Business Information Systems

2. Information about the course

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2.1 Course name		Information Integration					
2.2 Course coordinator			Associate Prof. Cătălin Strîmbei, Phd.				
2.3 Seminar coordinator			Ionut HRUBARU, Phd.				
2.4 Year of study	II	2.5 Semester	I	2.6 Type of assessment	P	2.7 Discipline status	C

* C – Compulsory / E - Elective

3. Total estimated time (hours allotted to didactic activity per semester)

3.1 Total number of hours per week	3	of which: 3.2 lecture	2	3.3 seminar/lab	1
3.4 Total number of hours in the curriculum	42	of which: 3.5 lecture	28	3.6 seminar/lab	14
Time distribution					hours
Study of the handbook, coursebook, bibliography and notes					30
Additional research in the library, online and on the field					15
Preparation of seminars/labs, homeworks and projects					40
Tutorials					15
Assessment					8
Other activities.....					
3.7 Total number of self-study hours					108
3.9 Total number of hours per semester					150
3.10 Number of credits					6

4. Prerequisites (if applicable)

4.1 curriculum-based	- Databases (or similar) - Software Development (or similar)
4.2 competence-based	- SQL - JEE/Spring Application Development for SOA (Service Oriented Architectures).



**5. Conditions** (if applicable)

5.1. for lectures	• Lecture rooms shall be provided with video projector. • Students will attend lectures. Cell phones must be turned off.
5.2. for seminars/labs	• IT services of the faculty will provide a real or virtual machine to act as Database SQL Server (Oracle, PostgreSQL) and No-SQL (MongoDB, Hbase, Cassandra) • Students are invited to bring and use their own laptops: Database Server (Oracle, MongoDB), SQL Developer, RoboMongo • Labs will have enough computers for students not owning a laptop. • Lab computers will have installed Java/JEE Tools, Oracle SQL Developer Tool

6. Assimilated specific competences

Professional competences	• C2.5 Develop projects and case-studies concerning modeling, implementation (database logic), administration and analysis of data for real-world applications (2) • C4.5 Write the specifications and deploy the modules regarding data, applications and services integration (3)
Transversal competences	• CT1 – The ability to communicate and collaborate in teams of different professionals (0.5) • CT3 – Continuous improvement of specific skills and knowledge towards approaching information systems, development of new software technologies and management of information systems. (0.5)

7. Discipline objectives (provided by the assimilated specific competences grid)

7.1 The general objective of the discipline	• To provide the core knowledge, methodologies and tools in order to be able to define and implement feasible and efficient strategies to acquire, integrate and optimize data collections originated from heterogeneous and web sources (SQL and NoSQL) and to prepare them to be suitable for the processing specific to BigData analytics.
7.2 Specific objectives	• Knowledge of Data Integration Design methodologies. • Knowledge and skills to implement distributed database systems. • Knowledge and skills to integrated Web based data providers with conventional database providers. • Knowledge and skills to prepare integrated data structures in order to be exploited by analytical tools.



**8. Content**

8. 1 Lectures	Teaching methods	Observations
Chapter 1. Data Integration Intro: Concepts, Process and Architectures 1.1 Data Integration problem and concepts 1.2 Data Integration process 1.3 Data Integration Architectures and Strategies	PPT presentation, explanation, conversation, questioning.	2 lectures
Chapter 2. Federated Database Architecture with Oracle Database 2.1 Oracle Federated System: Data Source Model - Oracle Federated Database: Integration with DB-Links - SQL Federated Databases with Oracle Gateway: OG4ODBC - SQL Federated Databases with external document files: CSV and XLSX - SQL Federated Databases with external document files: XML and JSON	PPT presentation, code execution, explanation, conversation, questioning.	2 lectures
2.2 Oracle Federated System: Integration Model - Consolidation Views and Analytical Views with SQL ROLAP 2.3 Oracle APEX Web Model - Web Views	PPT presentation, code execution, explanation, conversation, questioning.	2 lectures
Chapter 3. Data Service Architecture with Java: SQL Services 3.1 SQL JDBC Views - JDBC Access Strategies and Framework - JDBC REST Data Service Framework: Web JDBC views - JDBC Service Integration with Oracle FDB 3.2 SQL JPA Views - JPA Access Strategies and Framework - JPA REST Data Service Framework: Web JPA view - JPA Service Integration with Oracle FDB	PPT presentation, code execution, explanation, conversation, questioning.	2 lectures
Chapter 4. Data Service Architecture with Java: Document Services 4.1 XML Data Source Access and Services - XML Access Strategies and Frameworks - XML REST Data Service Framework: Web XML views - XML Service Integration with Oracle FDB 4.2 XLSx and JSON Data Source Access and Services - XLSx Access Strategies and Frameworks - XLSx REST Data Service Framework: Web XLSx views - XLSx Service Integration with Oracle FDB - JSON Access Strategies and Frameworks - JSON REST Data Service Framework: Web JSON views - JSON Service Integration with Oracle FDB	PPT presentation, code execution, explanation, conversation, questioning.	2 lectures
Chapter 5. Data Service Architecture with Java: Integration Services 5.1 Integration Model and Integration Services 5.2 Analytical Model and Analytical Services 5.3 Web Model and Web Services	PPT presentation, diagrams, explanation, conversation, questioning.	2 lectures





8. 2 Seminar/lab	Teaching methods	Observations
Design DI case study integrated data model (team project)	Demonstration, Scripts and code execution, Assisted Modelling, Questioning	1 lab
Federated Database Architecture with Oracle DB Server	Demonstration, Scripts and code execution, Assisted Modelling, Questioning	2 labs
Data Service Architecture with Java	Demonstration, Scripts and code execution, Assisted Modelling, Questioning	2 labs
Workshop 1: Federated Database Systems	Demonstration, Scripts and code execution, Assisted Modelling, Questioning	1 lab
Workshop 2: ETL, Database Virtualization, Java DI Tools	Demonstration, Scripts and code execution, Assisted Modelling, Questioning	1 lab
Bibliography		
AnHai Doan, Alon Halevy, Zachary Ives, <i>Principles of Data Integration</i>, 2012 Elsevier, Inc. Anthony Giordano, <i>Data integration: blueprint and modeling techniques for a scalable and sustainable architecture</i>, 2010, Pearson Education, Inc. April Reeve, <i>Managing Data in Motion Data Integration Best Practice Techniques and Technologies</i>, 2013 Elsevier, Inc. Fotache, M., <i>Proiectarea bazelor de date. Normalizare și postnormalizare. Implementări SQL și Oracle</i>, Ed. Polirom, Iași, 2005 Fotache, M., <i>SQL. Dialecte DB2, Oracle, PostgreSQL și SQL Server</i>, Ed. Polirom, Iași, 2009 Fotache, M., Strîmbei, C., Crețu, L., <i>Oracle 9i2. Ghidul dezvoltării aplicațiilor profesionale</i>, Ed. Polirom, Iași, 2003 Garcia-Molina, H., Ullman, J., Widom, J. – <i>Database Systems. The Complete Book</i>, Prentice Hall, Upper Saddle River, NJ, 2002 Anthony David Giordano, <i>Data integration : blueprint and modeling techniques for a scalable and sustainable architecture</i>, Pearson Education, Inc, 2010 Liyang Yu, <i>A Developer's Guide to the Semantic Web</i>, Springer-Verlag Berlin Heidelberg 2011 Bob DuCharme, <i>Learning SPARQL Querying and Updating with SPARQL 1.1</i>, 2013 O'Reilly Media Marz, N., Warren, J. (2014), <i>Big Data. Principles and best practices of scalable realtime data systems</i>, Manning Publications.		



**9. Corroboration of the discipline content with the expectations of epistemic community representatives, professional associations as well as of representative employers in the programme related field.**

- The content of this discipline has been decided upon by considering both the curricula of some prestigious Western Universities and the demands of the economic environment provided by potential employers, either in the public or in the private IT companies.

10. Assessment

Type of activity	10.1 Assessment criteria	10.2 Assessment methods	10.3 Share of final grade
Part I of the project	Validity and elegance of the solution	Presentation, code execution, discussion of each team's solution	25%
Part II of the project	Validity and elegance of the solution	Presentation, code execution, discussion of each team's solution	25%
Part III of the project	Validity and elegance of the solution	Presentation, code execution, discussion of each team's solution	25%
Course Workshop	Completeness, Study Case Relevance	Presentation, code execution, discussion	25%
10.6 Minimum performance standard			
• Final grade ≥ 5			

Date of completion
01.10.2020

Lecture Coordinator
Assoc.Prof. Cătălin Strîmbei, Ph.D.

Seminar Coordinators
Asist. Ionut HRUBARU

